North Carolina Department of Transportation
Division of Highways

Guidelines for Planting within Highway Right-of-Way

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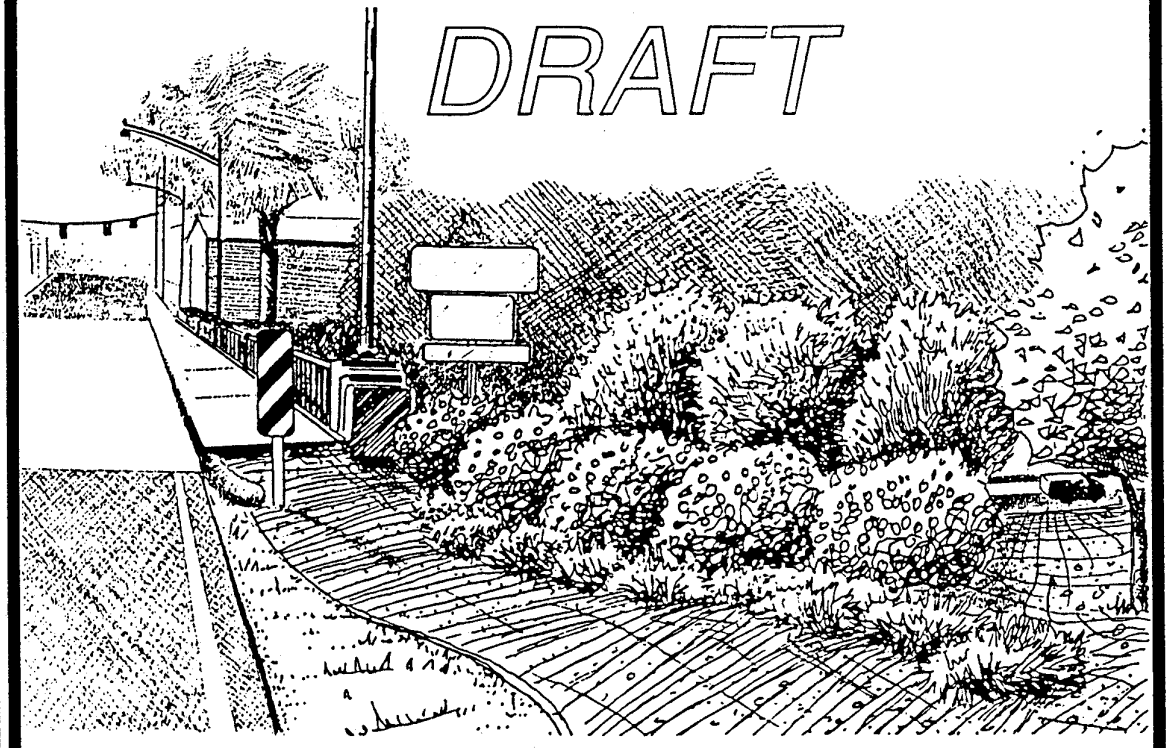

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GUIDELINES FOR PLANTING WITHIN HIGHWAY RIGHT-OF-WAY

FORWARD

The aesthetic quality of North Carolina's roadsides is influenced by a number of factors. Among these factors are right-of-way widths, adjacent land use, parallel overhead utility lines, advertising signs, and surrounding vegetation.

In order to protect the public investment in highways, the North Carolina Department of Transportation, Division of Highways, depends largely upon grass and legume covers to prevent roadside erosion and upon shrubs and trees for reduced mowing areas and for improvement of aesthetic quality.

Shrubs and trees within highway rights-of-way result from either retaining desirable vegetation during initial highway construction, allowing portions of roadsides to regenerate, or from planting or reforesting selected roadside areas. Limited monetary and manpower resources prevent the North Carolina Division of Highways from planting shrubs and trees on all roadside where these would be desirable. Planting of specific roadside areas is frequently undertaken by municipalities, garden clubs, or individuals after permission is granted from the Division of Highways.

North Carolina General Statute 136-93 provided,

> *". . . no tree or shrub in or on any State road or State highways shall be planted, trimmed, or removed, . . .without a written permit, and then only in accordance with the regulations of said Department of Transportation or its duly authorized officers or employees; and the work shall be under the supervision and to the satisfaction of the Department of Transportation or its officers or employees, and the entire expense of replacing the highway in as good condition as before shall be paid by the persons, firms, or corporations to whom the permit is given, or by whom the work is done."*

Included herein, are guidelines for obtaining permits and for planting within highway right-of-way.

PROCEDURES FOR HANDLING REQUESTS FOR PERMITS FOR PLANTING ON HIGHWAY RIGHT-OF-WAY

Many requests are received from municipalities, civic organizations, and individuals for permission to plant trees, shrubs, vines, and flowers within highway right-of-way. In order to protect the public investment and to promote safety, utility, economy, and beauty in highways, the following procedures for handling planting requests have been developed:

Interstate and Other Controlled Access Highways

Planting by other than Division of Highways personnel on Interstate or Other Controlled-Access Highways is discouraged. These facilities are designed for high speed, unencumbered traffic movement and are usually fenced to prevent people, animals, or other impediments to traffic from entering the rights-of- way. The safety of highway users is paramount and considerable traffic devices are required when work is being done within these right-of-way.

In those instances where planting is desired by other than Division of Highways personnel, the requesting party should arrange a conference with the Area Roadside Environmental Engineer who will explain Division of Highways criteria for sight distances, recovery areas, and minimum setback distances. Following this explanation, the requesting party must prepare a detailed planting plan (to scale) describing the various species of plants to be used and the proposed locations of plants. The plan is to be submitted to the Division Engineer.

Other State System Right-of-Way

The attached *Guidelines for Tree, Shrub, and Groundcover Planting on Highway Right-of-Way Other than Controlled-Access or Interstate* are to be followed.

Upon receipt of a request for planting, accompanied by a plan and typical cross section, the Division Engineer or his representative, in conjunction with the Area Roadside Environmental Engineer, will make an on-site investigation of the proposed planting. If the planting proposal does not conform with the attached guidelines, the request may be denied by the Division Engineer. If the proposed planting is in conformity with the guidelines, the Division Engineer will issue a letter-type permit for planting with a copy of such permit (together with a plan and typical cross section) to the State Roadside Environmental Engineer.

Before any action will be taken on a request for a permit for planting within a municipality, the request must have the approval of the governing body since the planting permit will be issued to the municipality. Request for planting outside municipalities will be considered using the attached guidelines and permits for planting will be issued to the party requesting the permit.

Standard conditions to be enumerated in planting permits are:

1. In the event these plants require relocation or removal for highway construction, reconstruction, maintenance or safety, such removal or relocation will be done immediately by the (municipality/civic group/individual) upon notification by the Division of Highways, entirely at the expense of the permitee.

2. The Division of Highways will not be responsible for any damage to the planting which may be done by third parties.

3. Maintenance of the plantings will be the responsibility of (Division of Highways/permitee).

Other conditions as determined by the Division Engineer and Area Roadside Environmental Engineer which are peculiar to the specific planting proposal will be enumerated along with the standard conditions above.

The Roadside Environmental Unit in Raleigh may be consulted regarding any planting proposal which the Division Engineer and Area Roadside Environmental Engineer determine has merit but which does not conform with standards as previously described due to extenuating circumstances.

Three methods by which planting request may be approved are:

1. A planting permit can be issued to allow planting and maintenance of the planting by the permitee;

2. The permitee can furnish funds for the plant materials with highway landscape forces doing the planting and assuming maintenance of the planting:

3. The Division of Highways can assume the project entirely, bearing the cost of plant materials as well as doing the planting and plant maintenance. (These planting projects will normally be included in the Transportation Improvement Program with funding being approved by the Board of Transportation.)

The Division Engineer must determine the ability of Division Roadside Environmental forces to assume the additional maintenance of planting required before entering an agreement as described in number 2, preceding.

Roadside Environmental Unit personnel may assist requesting parties in the development of proposals for planting on highway right-of-way, as workloads permit! The North Carolina Division of Forest Resources, Urban Forestry Section, may be called upon by municipalities and civic organizations for assistance in planting proposals on city streets and other areas which are not a part of the State Highway System.

Planting Encroachment on NCDOT R/W

I. Requesting party obtains approval of municipality (Only if theR/W is within a municipality)

II. Conference with Area Roadside Environmental Engineer

III. Explanation of Criteria to party by Area Roadside Environmental Engineer

   A. Sight Distance
   B. Recovery areas
   C. Safety setbacks

IV. Requesting party submits planting plan to Division Engineer

   A. Scaled drawing
   B. Plant list
   C. Location of plants

Permitting Process

I. Division Engineer requests investigation by Division Roadside Environmental Engineer an Area Roadside Environmental Engineer as appropriate

II. Division Engineer either denies request or

III. Division Engineer approves request and issues letter-type permit

   A. Permit to municipality if within municipality

   B. Permit to party if not in municipality

IV. Copy of permit to State Roadside Environmental Engineer

GUIDELINES FOR TREE, SHRUB AND GROUNDCOVER PLANTING ON HIGHWAY RIGHTS-OF-WAY OTHER THAN CONTROLLED ACCESS OR INTERSTATE

The following guidelines for tree, shrub and groundcover planting apply to those State Highway System highways and streets with posted speed limits as indicated below. Planting that involves exceptions to these criteria will be considered on an individual basis.

Distance from Travel Lane

The following are minimum distances from the curb or the edge of travel lanes for new plantings. Where existing tree distances outside curbs or edges of travel lanes have been established, replacement trees may be allowed to conform with established set-back distances.

35 Miles Per Hour or Less

Curb and Gutter Section

Large trees	10'
Small trees or large shrubs	5'
Small shrubs	1' to foliage line

Shoulder and Ditch Section

Large trees	12'
Small trees or large shrubs	8'
Small shrubs	6' to foliage line

Over 35 Miles Per Hour Through 45 Miles Per Hour

Curb and Gutter Section

Large trees	15'
Small trees or large shrubs	8'
Small shrubs	6' to foliage line

Shoulder and Ditch Section

Large trees	20'
Small trees or large shrubs	10'
Small shrubs	8' to foliage line

Greater Than 45 Miles Per Hour

Curb and Gutter Section

Large trees	25'
Small trees or large shrubs	20'
Small shrubs	10' to foliage line

Shoulder and Ditch Section

Large trees	30'
Small trees or large shrubs	20'
Small shrubs	15' to foliage line

Vertical Clearance

A minimum clearance of 16 ft. above the entire pavement width must be maintained at all times, and also a minimum clearance of 7 ft. above a sidewalk or pedestrian space.

Sight Distances

Shrubs must be kept low, and trees and large shrubs under-trimmed sufficiently to permit clear sight in the area between 2 feet and 6 feet above roadway elevations. Due to widely varying conditions of topography, highway alignment and grade, type and volume of vehicular and pedestrian traffic, necessary sight distances longitudinally along the highway and in excess of the lateral minimum described above must be individual site determinations.

Selection of Plants

Tall-growing trees should not be selected for planting beneath utility lines and wide-spreading trees should not be used unless there is sufficient width of planting area to accommodate them without continued severe pruning.

Small trees and large shrubs should be used which are adaptable to undertrimming without destroying their desired normal appearance. Only low-growing shrubs are to be used in medians and close to the edge of shoulders to avoid need for continued severe pruning. In some locations, all shrubs should be omitted, but this must be an individual site determination.

In curb and gutter areas, groundcover is permissible between curb and shrubs to avoid a narrow mowing strip.

Pavement Removal

When pavement remains beneath traffic channelization islands, such pavement may not be broken or removed without written permission.

Effect on Mowing and Drainage

Trees should be placed sufficiently far apart, and shrubs should be grouped in beds and mulched in a shape that will facilitate mower operation and avoid excessive mower maneuvering or hand trimming. Plantings are to be minimum of 2 feet behind ditch line in cut sections and 2 feet outside shoulder break in fill sections, or the minimum distance from edge of travel lanes as stated in breakdown of speed limits as shown on Typical Sections, whichever is the greater.

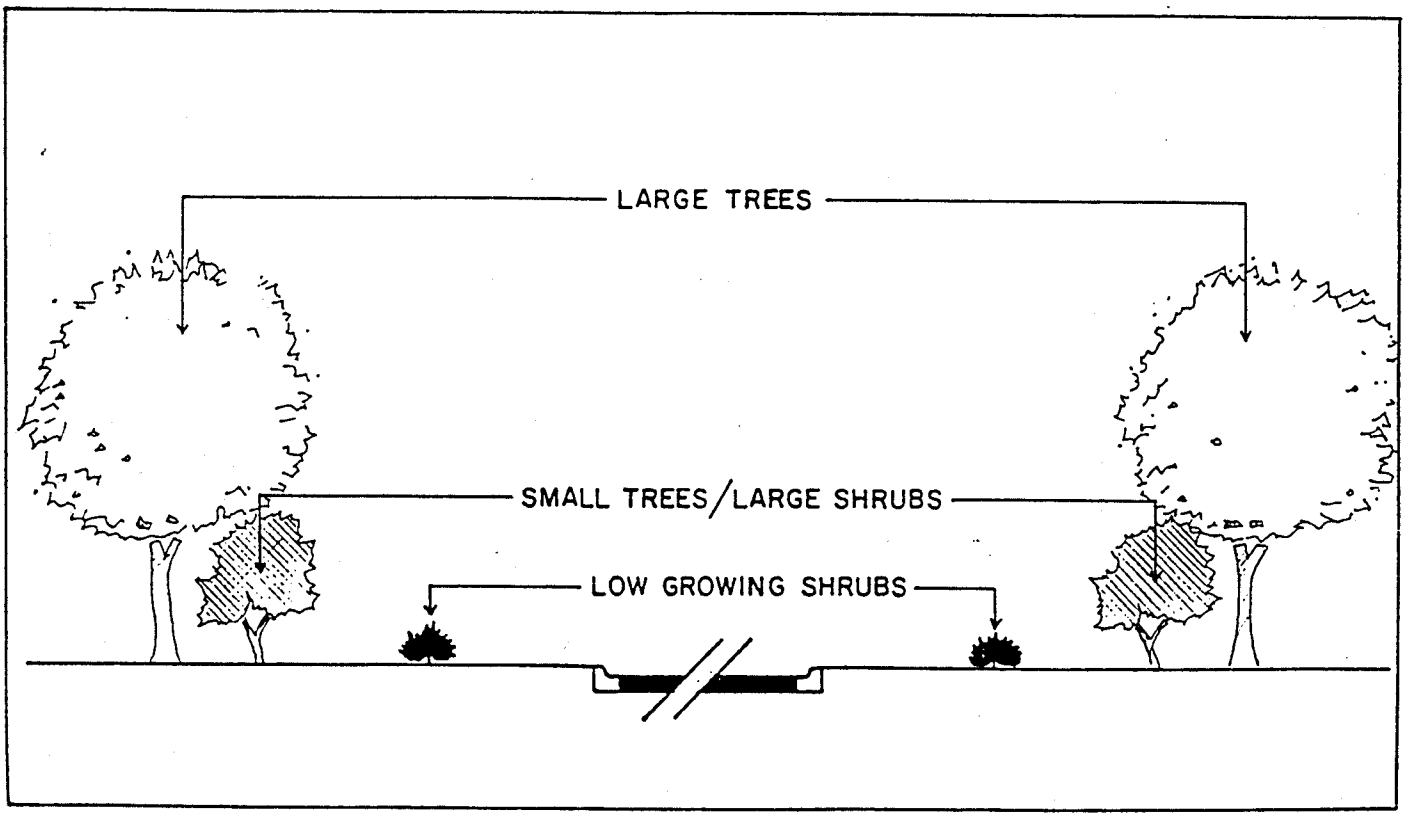
Traffic Operation and Safety

All plantings are to be maintained in a condition which will not interfere with nor endanger either vehicular or pedestrian traffic.

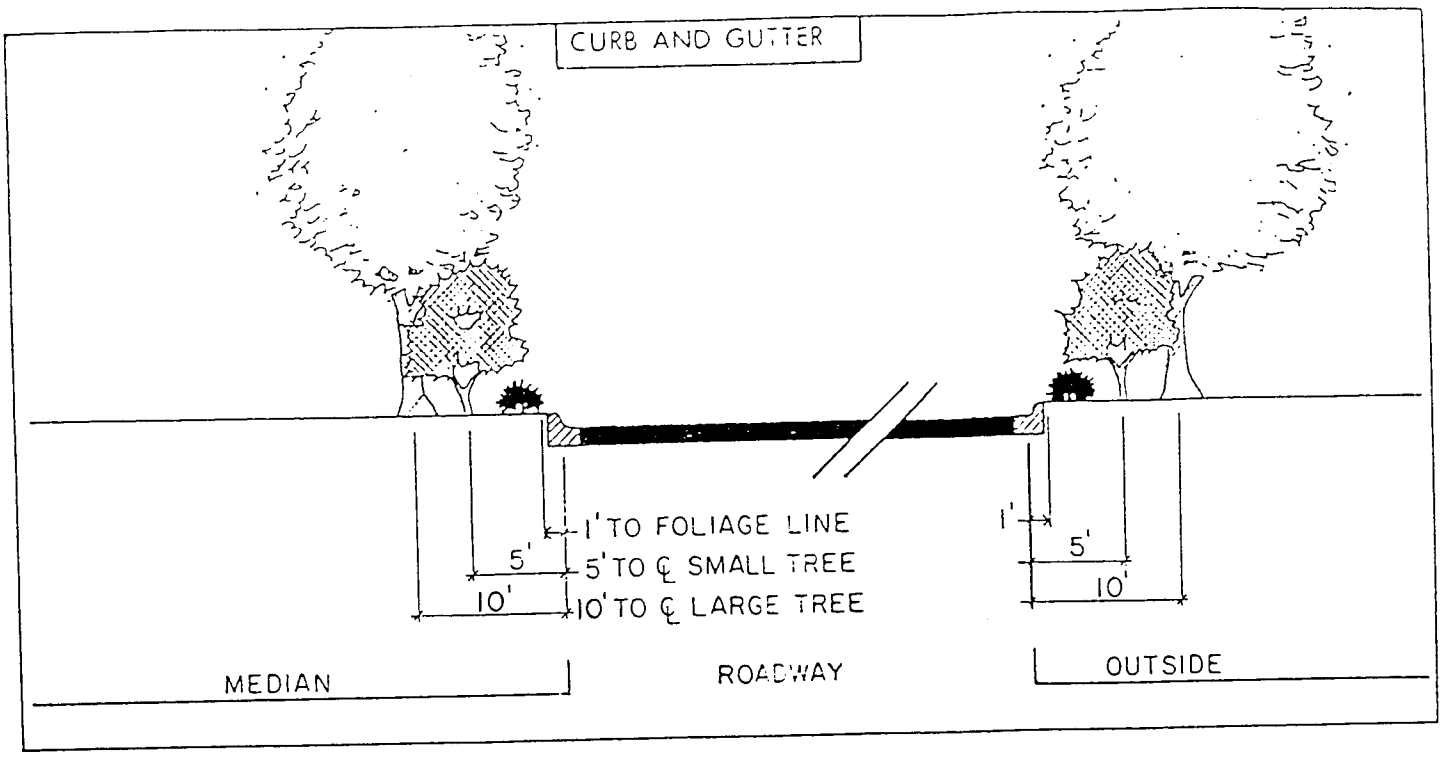
TYPICAL SECTIONS

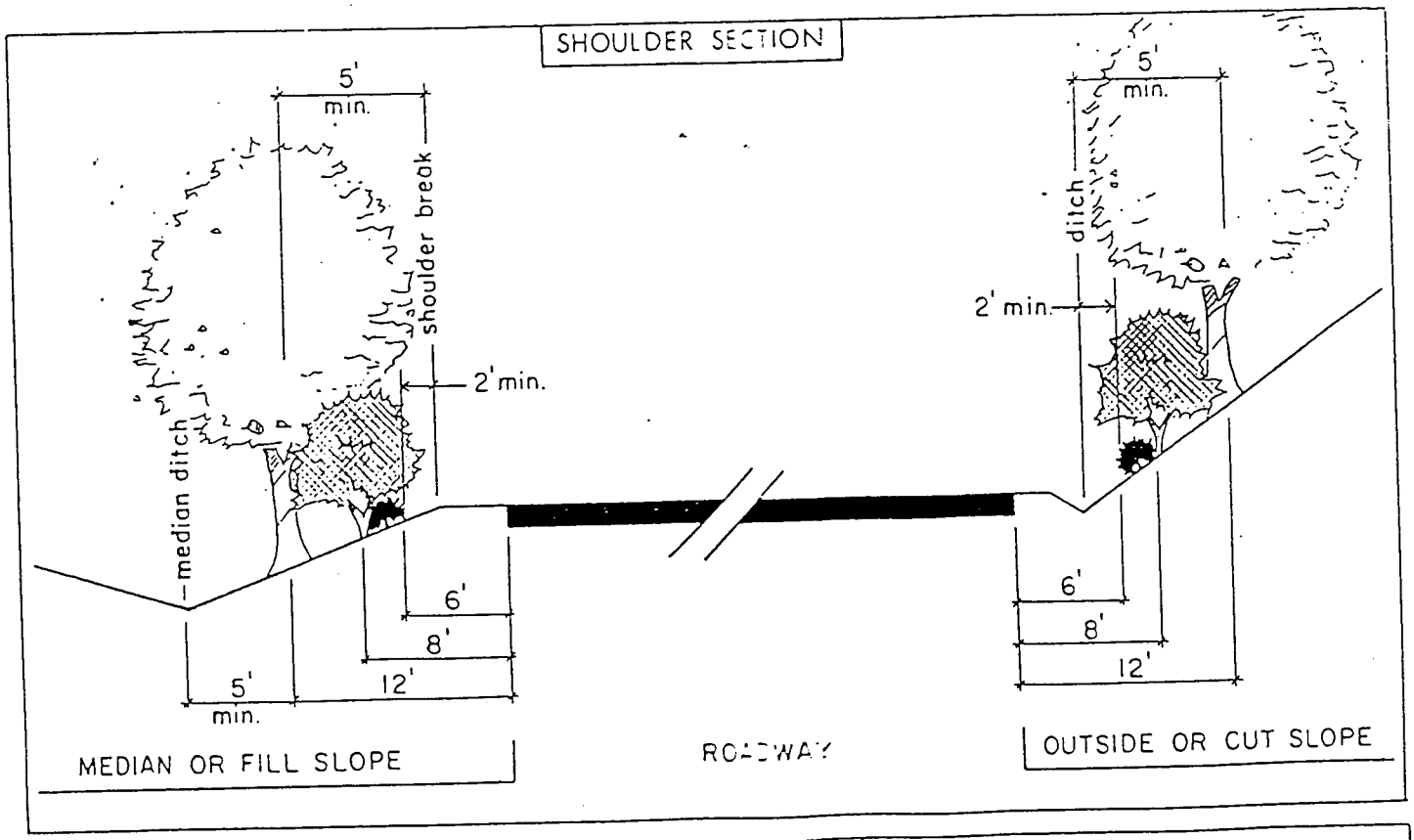
FOR VARIOUS POSTED SPEED LIMITS

MINIMUM DISTANCES



35 MPH & LESS

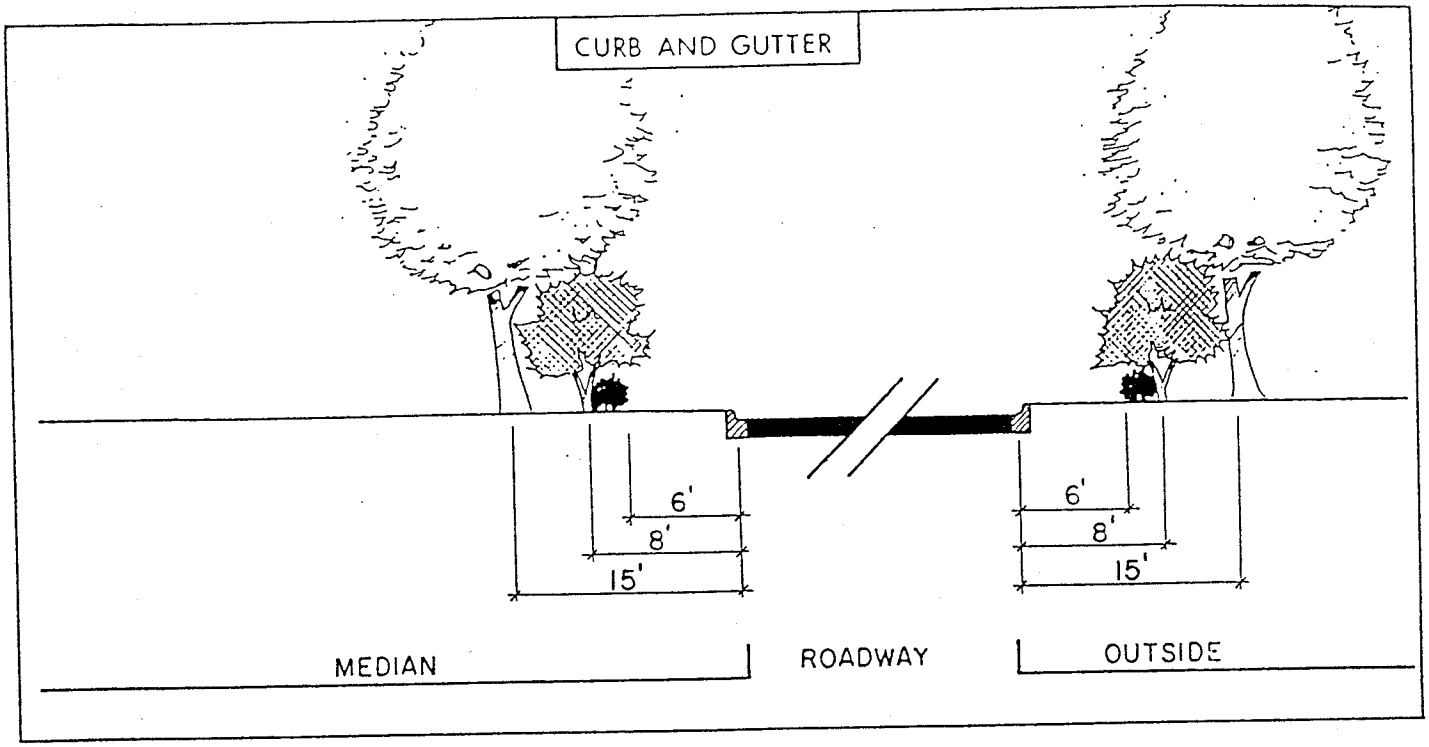


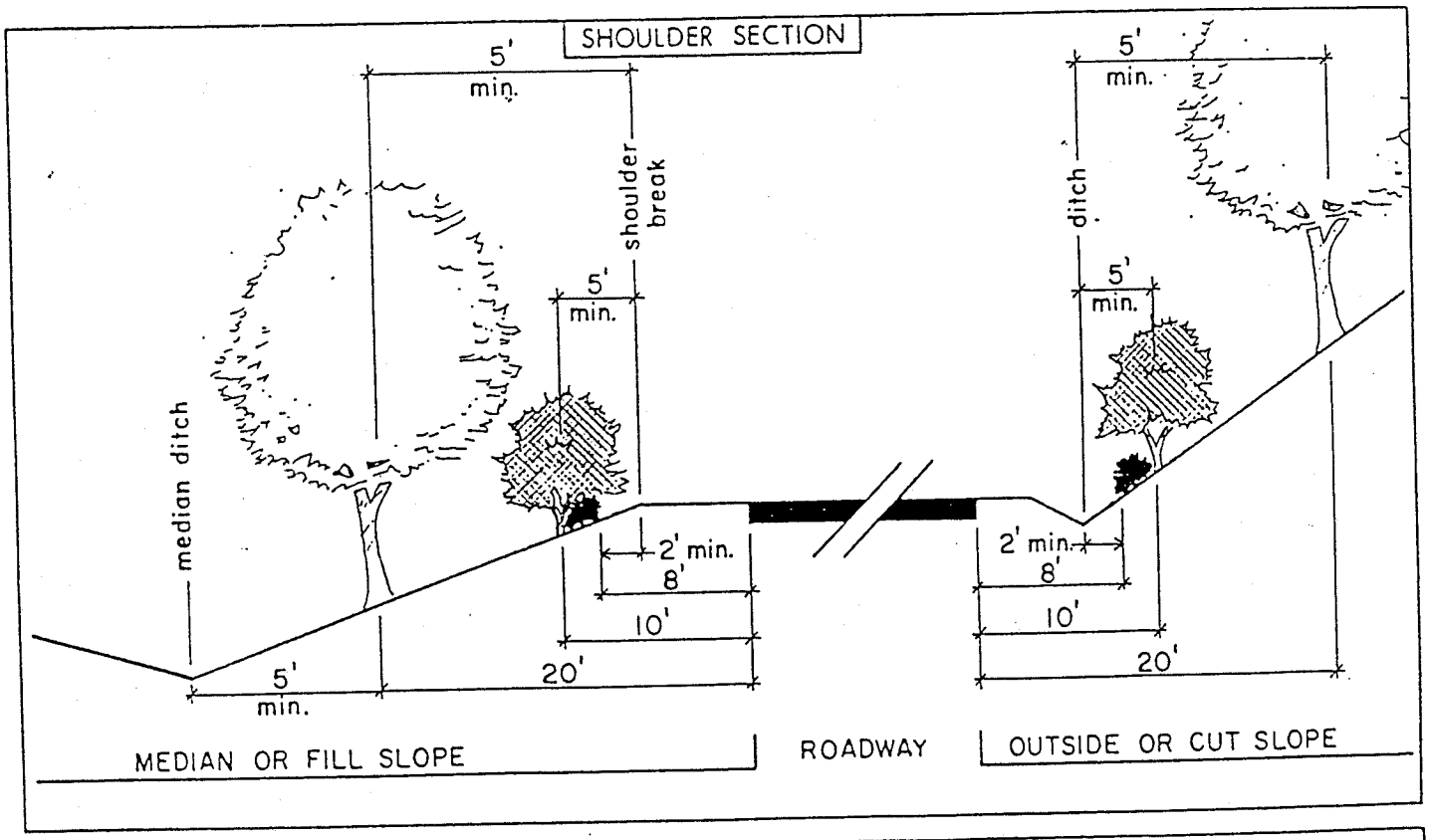


NOTES

- MEDIAN MUST BE AT LEAST 30' WIDE BEFORE LARGE TREES MAY BE PLANTED
- PAVEMENT WIDTH MAY VARY
- WHEN WIDTH OF SHOULDERS & DITCHES DO NOT CONFORM WITH THESE TYPICAL SECTIONS, THE 2' MINIMUM DISTANCE BEHIND THE DITCH & 2' MINIMUM DISTANCE OUTSIDE THE SHOULDER BREAK SHALL GOVERN.

GREATER THAN 35 MPH THROUGH 45 MPH



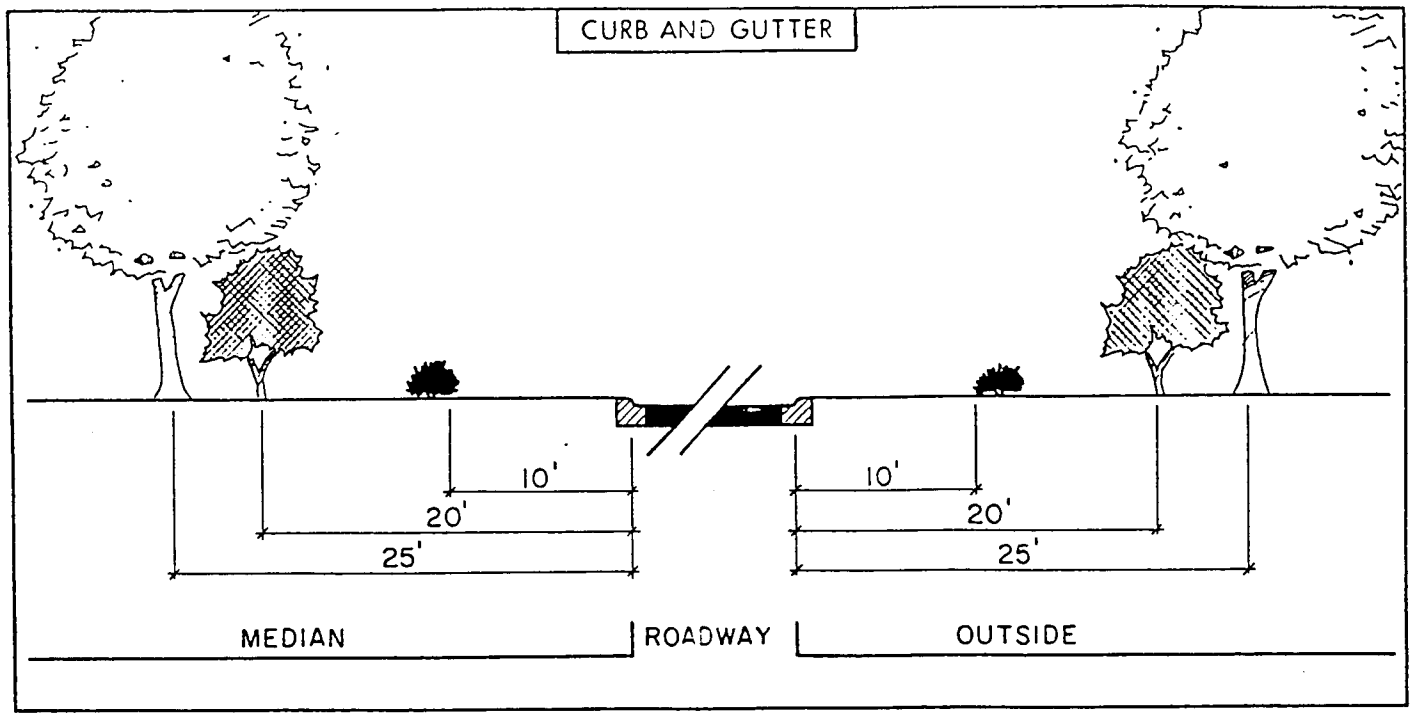


NOTES

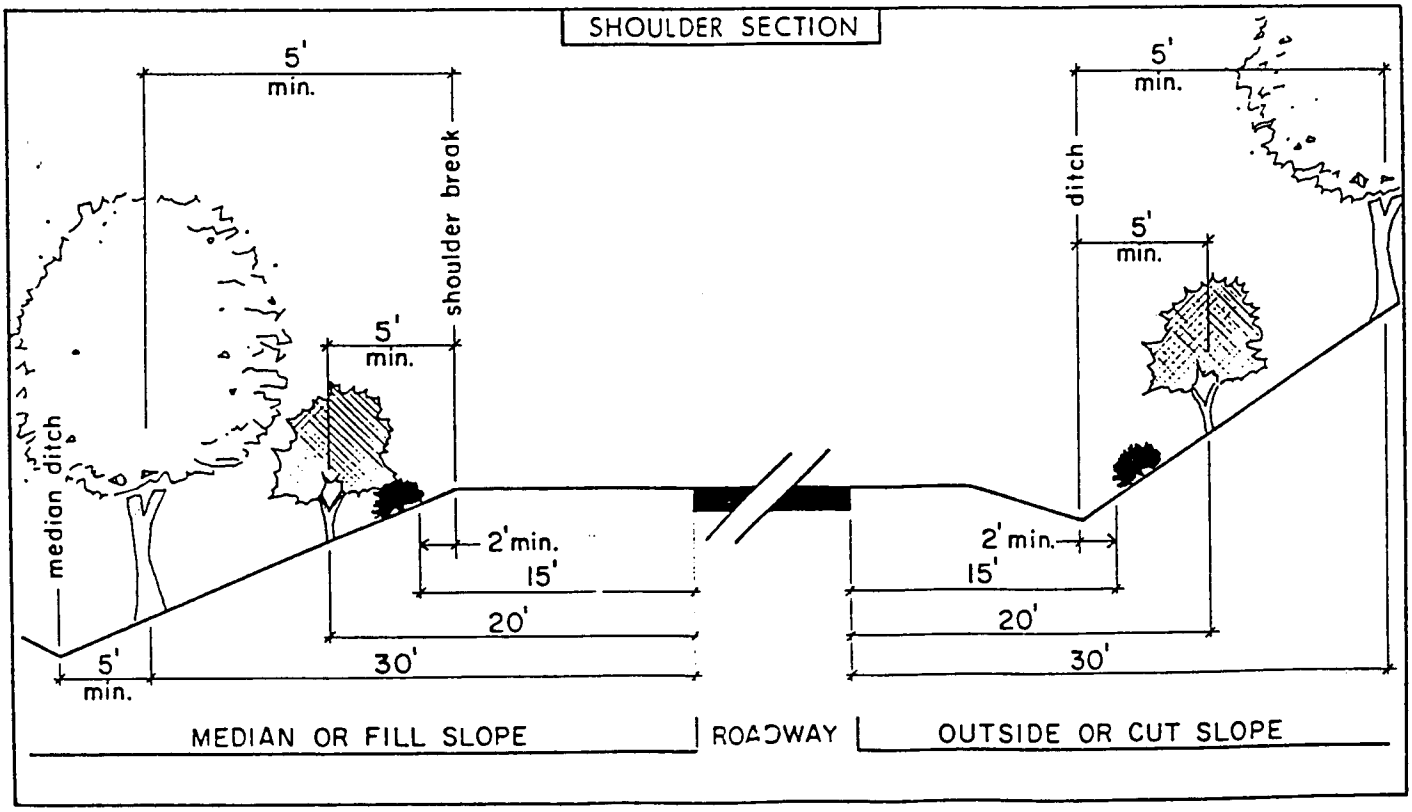
- MEDIAN MUST BE AT LEAST 44' WIDE BEFORE LARGE TREES MAY BE PLANTED
- PAVEMENT WIDTH MAY VARY
- WHEN WIDTH OF SHOULDERS & DITCHES DO NOT CONFORM WITH THESE TYPICAL SECTIONS, THE 2' MINIMUM DISTANCE OUTSIDE THE SHOULDER BREAK & 2' MINIMUM DISTANCE BEHIND THE DITCH SHALL GOVERN.

GREATER THAN 45 MPH

CURB AND GUTTER

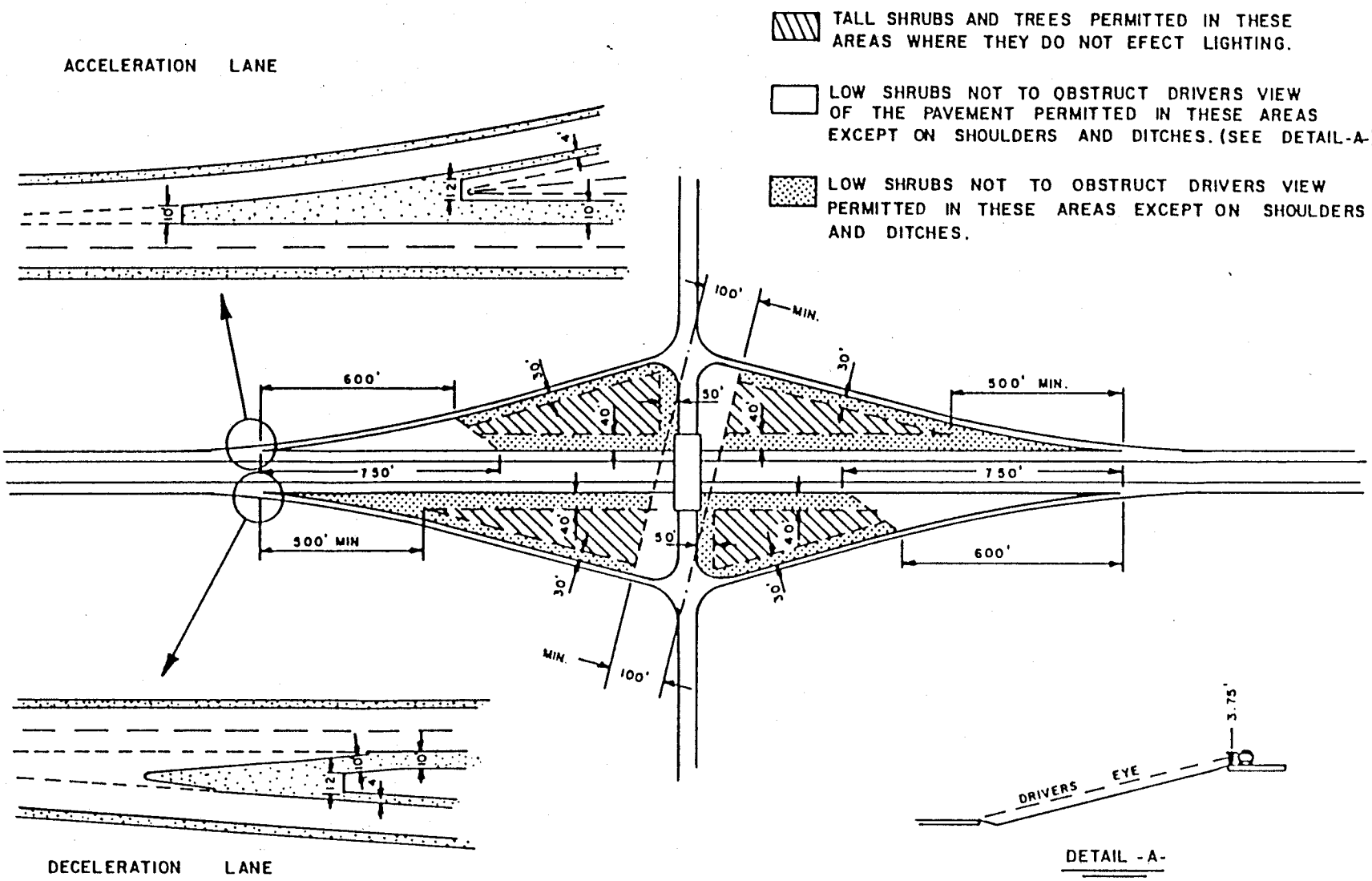


SHOULDER SECTION



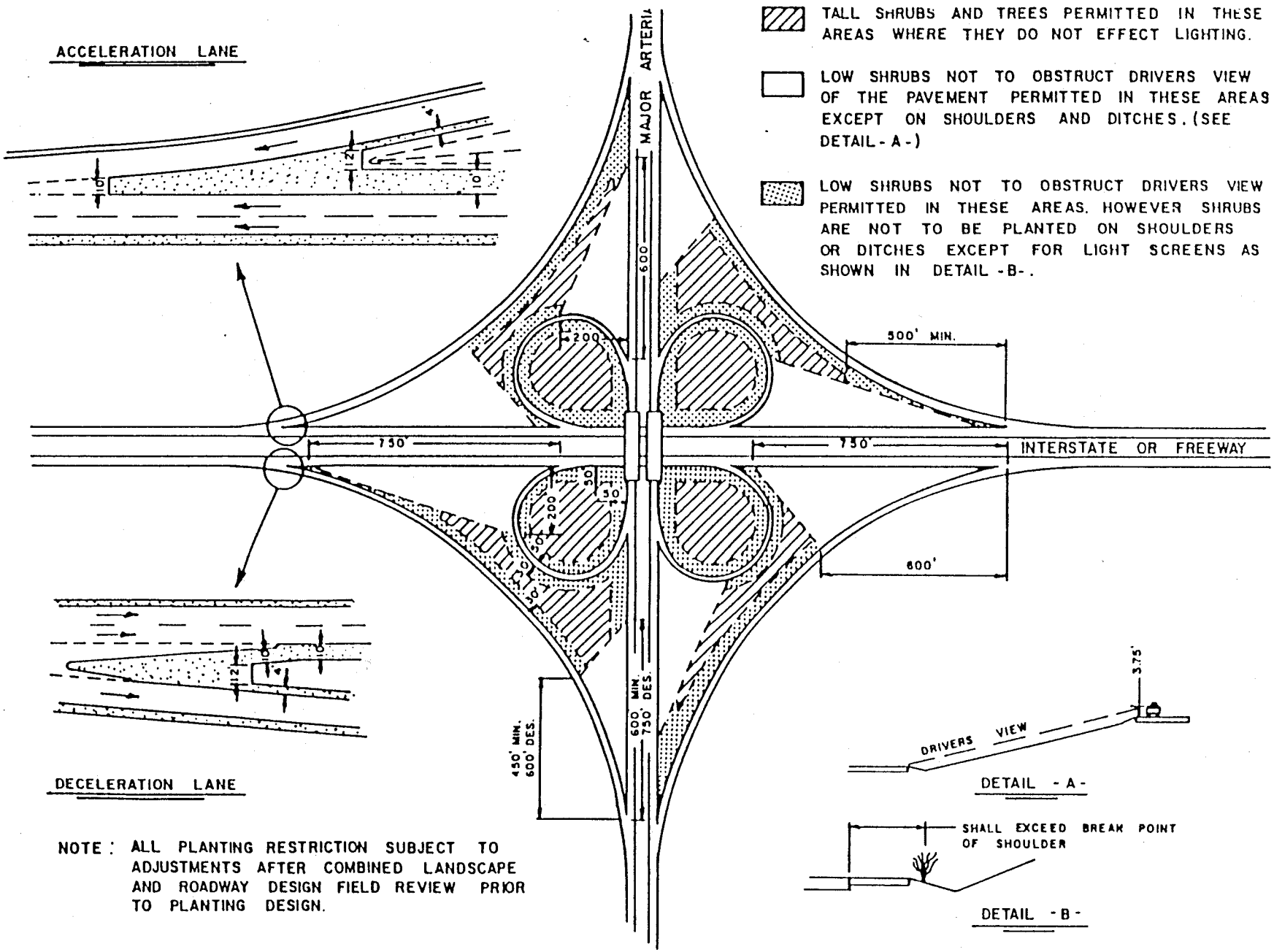
NOTES

- MEDIAN MUST BE AT LEAST 60' WIDE BEFORE LARGE TREES MAY BE PLANTED
- PAVEMENT WIDTH MAY VARY
- WHEN WIDTH OF SHOULDERS & DITCHES DO NOT CONFORM WITH THESE TYPICAL SECTIONS, THE 2' MINIMUM DISTANCE BEHIND THE DITCH & 2' MINIMUM DISTANCE OUTSIDE THE SHOULDER BREAK SHALL GOVERN.



NOTE : ALL PLANTING RESTRICTION SUBJECT TO ADJUSTMENTS AFTER COMBINED LANDSCAPE AND ROADWAY DESIGN FIELD REVIEW PRIOR TO PLANTING DESIGN.

GUIDE FOR LANDSCAPE PLANTING AT DIAMOND INTERCHANGES



GUIDE FOR LANDSCAPE PLANTING AT CLOVERLEAF INTERCHANGES

PLANTING SUGGESTIONS

Plants should be planted in their permanent location immediately upon receipt or should be adequately protected until planted. It is not necessary to remove the burlap but the strings from around the stem of the plant must be removed and the burlap should be folded from the top of the ball after the plant is in the hole. The soil around the plant should be tamped to remove air pockets. Mulching, to help retain moisture is mandatory and should not contain substances which would inhibit normal development and growth of plants.

Trees which have heavy tops or which are over six feet in height should be staked or guyed to prevent winds from loosening the roots. (See details following.)

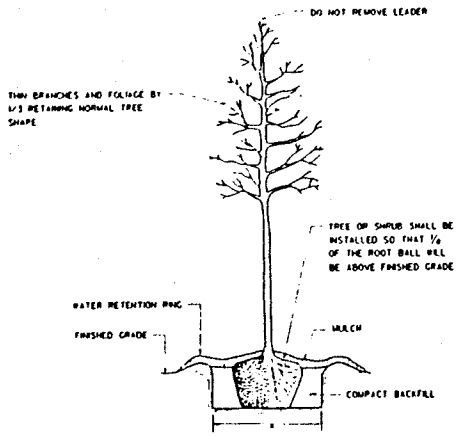
All plants should be soaked thoroughly with water at planting time and once a week (unless soaking rains occur) thereafter during the first growing season. Keep the plant watered.

Deciduous shrubs should be cut back to between one-half and one-third their original size.

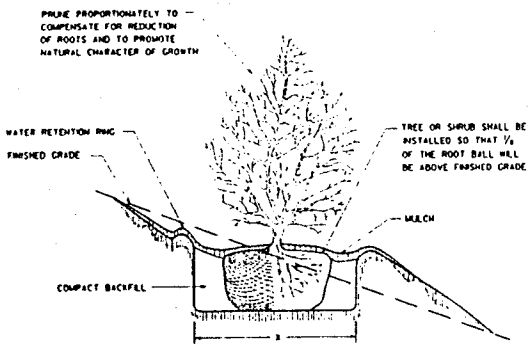
Evergreens usually need only light pruning and shaping after transplanting, if any. The central leader of trees should not be removed.

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS

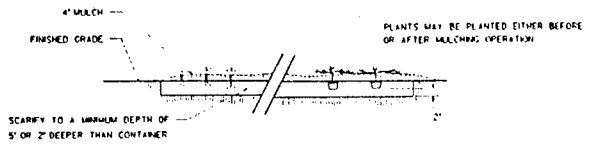
STATE PROJ NO.	F. A. PROJ NO.	DESCRIPTION



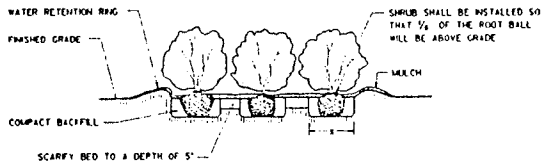
TREE OR SHRUB PLANTING DETAIL
(LEVEL GROUND)



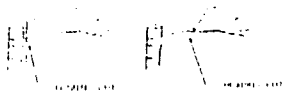
TREE OR SHRUB PLANTING DETAIL
(SLOPING GROUND)



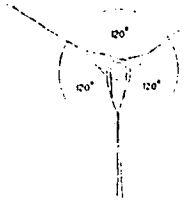
GROUNDCOVER PLANTING DETAIL



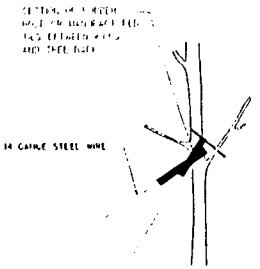
SHRUB BED PLANTING DETAIL



PRUNING CUTS



GUY SPACING DETAIL



GUY TYING DETAIL

NOTES:

SCHEDULE FOR PLANT HOLE SIZE:
CONTAINER OR ROOT BALL SIZE
2 TIMES THE DIAMETER OF THE CONTAINER OR THE ROOT BALL DIAMETER

FERTILIZER SCHEDULE:

TREES AND SHRUBS:	TWO CUPS COMPOSTED COW MANURE PER 1" OF ROOT BALL OR CONTAINER DIAMETER
GROUND COVER:	ONE GALLON COMPOSTED COW MANURE PER SQUARE YARD OF BED

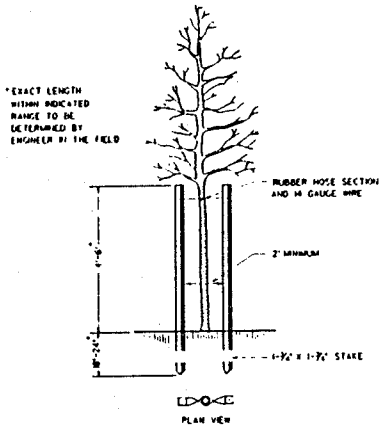
THOROUGHLY MIX WITH TOP SOIL BACKFILL OR SCARIFIED SOIL

REMOVE BURLAP FROM TOP OF BALL BEFORE BACKFILLING AROUND BALL IS COMPLETE

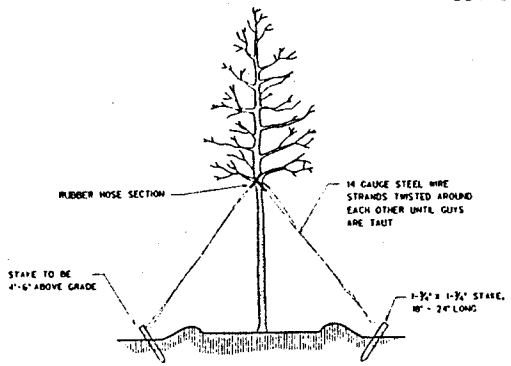
ALL TREES WHICH ARE SMOOTH BARKED AT THE TIME OF PLANTING AND WHICH HAVE MORE THAN 2' OF CLEAR TRUNK SHALL BE WRAPPED

ALL TREE WRAPPING SHALL EXTEND FROM TOP OF BACKFILL TO LOWERMOST BRANCHES

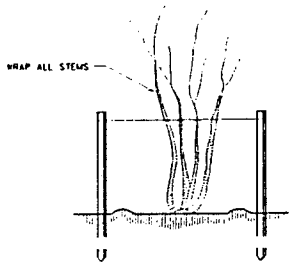
SEE STANDARD SPECIFICATIONS FOR PLANT BED ESTABLISHMENT



STAKING DETAIL
(FOR TREES 6' TO 10')



TREE GUYING DETAIL
(FOR TREES 10' OR LARGER)



GUYING & STAKING

PLANTING DETAILS

N.C.D.O.T. - ROADSIDE ENVIRONMENTAL UNIT

NO SCALE

PLANT LISTS

The following pages contain lists of plants, in several categories, which have proven to be suitable and adaptable for highway plantings.

Highway roadsides are, typically, somewhat hostile environments for plant establishment and development. Subsoils are generally encountered and these contain minimal plant nutrients; water for highway plants depends totally upon rainfall since there is limited opportunity for irrigation; and automobile emissions are detrimental to many plant species. Selection of appropriate plant material which will survive in the roadside environment is the most important element in undertaking a highway planting project.

The following list of plants are typically used in highway plantings. These are suggested plants which my be considered in planting design.

LARGE DECIDUOUS TREES

				a	b	c	x		A.S.N.S. +	HEIGHT	REMARKS
AP	ACER PLATANOIDES	NORWAY MAPLE		8-10'; 1¾-1½"	10-12'; 1¾-2"	12-14'; 2-2½"			1.1.5.1	90'	Dense; Globose head
AR	ACER RUBRUM	RED MAPLE		8-10'; 1¾-1½"	10-12'; 1¾-2"	12-14'; 2-2½"			1.1.5.1	120'	Native tree; Red fall color
AS	ACER SACCHARUM	SUGAR MAPLE		8-10'; 1¾-1½"	10-12'; 1¾-2"	12-14'; 2-2½"			1.1.5.1	120'	Conical to round head; Orange color
BG	BETULA PENDULA 'GRACILIS'	CUTLEAF WEEPING BIRCH	*	6-8'; ¾-1"	8-10'; 1¾-1½"	10-12'; 1¾-2"			1.1.5.1	60'	Lacy texture; White peeling bark
BN	BETULA NIGRA	RIVER BIRCH		6-8'; ¾-1"	8-10'; 1¾-1½"	10-12'; 1¾-2"			1.1.5.1	90'	Native tree; Wet areas
BP	BETULA PENDULA	EUROPEAN WHITE BIRCH	*	6-8'; ¾-1"	8-10'; 1¾-1½"	10-12'; 1¾-2"			1.1.5.1	60'	White peeling bark; Pendulous branches
CI	CARYA ILLINOENSIS	PECAN		8-10'; 1¾-1½"	10-12'; 1¾-2"	12-14'; 2-2½"			1.1.5.1	150'	Irreg. growth; Wet areas w/good drainage
CO	CARYA OVATA	SHAGBARK HICKORY		4-5'	5-6'	8-10'; 1¾-1½"			1.1.5.2	120'	Grey shaggy bark; White nuts
FA	FRAXINUS AMERICANA	WHITE ASH		8-10'; 1¾-1½"	10-12'; 1¾-2"	12-14'; 2-2½"			1.1.5.1	120'	Fast growing; Yellow fall color
FG	FAGUS GRANDIFOLIA	AMERICAN BEECH		8-10'; 1¾-1½"	10-12'; 1¾-2"	12-14'; 2-2½"			1.1.5.2	90'	Smooth, light-grey bark
GB	GINKGO BILOBA	GINKGO		4-5'	5-6'	6-8'			1.1.5.2	120'	Very slow growing; Use male only
GI	GLEDITSIA TRIACANTHOS 'INERMIS'	THORNLESS HONEYLOCUST	*	8-10'; 1¾-1½"	10-12'; 1¾-2"	12-14'; 2-2½"			1.1.5.1	135'	Very fast growing; Lacy foliage
GT	GLEDITSIA TRIACANTHOS	COMMON HONEYLOCUST		8-10'; 1¾-1½"	10-12'; 1¾-2"	12-14'; 2-2½"			1.1.5.1	135'	Upright, semi-conical; Medium density
JN	JUGLANS NIGRA	EASTERN BLACK WALNUT		8-10'; 1¾-1½"	10-12'; 1¾-2"	12-14'; 2-2½"			1.1.5.2	150'	Toxic roots; Coarse texture
LS	LIQUIDAMBAR STYRACIFLUA	AMERICAN SWEETGUM		8-10'; 1¾-1½"	12-14'; 2-2½"	14-16'; 3-3½"			1.1.5.2	125'	Fast growing; Variable fall color
LT	LIRIODENDRON TULIPIFERA	TULIPTREE		8-10'; 1½-1¾"	12-14'; 2-2½"	14-16'; 3-3½"			1.1.5.1	150'	Yellow fall color; Cylindrical head
MA	MAGNOLIA ACUMINATA	CUCUMBERTREE MAGNOLIA		4-5'	5-6'	6-8'			1.1.5.3	90'	Coarse texture; Pink to red "cucumbers"
NS	NYSSA SYLVATICA	BLACK GUM		4-5'	5-6'	8-10'; 1¾-1½"			1.1.5.2	90'	Scarlet fall color; Wet areas
OA	OXYDENDRON ARBOREUM	SOURWOOD		4-5'	5-6'	8-10'; 1¾-1½"			1.1.5.3	75'	Native tree; White flowers
PA	POPULUS ALBA	WHITE POPLAR		8-10'; 1¾-1½"	10-12'; 1¾-2"	12-14'; 2-2½"			1.1.5.1	90'	Grey-white bark; Large broad head
PO	PLATANUS OCCIDENTALIS	SYCAMORE		8-10'; 1¾-1½"	12-14'; 2-2½"	14-16'; 3-3½"			1.1.5.1	100'	Native tree; Coarse texture
QA	QUERCUS ALBA	WHITE OAK		8-10'; 1¾-1½"	10-12'; 1¾-2"	12-14'; 2-2½"			1.1.5.2	90'	Dense rounded head
QB	QUERCUS RUBRA	NORTHERN RED OAK		8-10'; 1¾-1½"	10-12'; 1¾-2"	12-14'; 2-2½"			1.1.5.1	75'	Dense, broad head; Red fall color
QC	QUERCUS COCCINEA	SCARLET OAK		8-10'; 1¾-1½"	10-12'; 1¾-2"	12-14'; 2-2½"			1.1.5.1	75'	Open rounded head; Scarlet fall color
QN	QUERCUS NIGRA	WATER OAK		8-10'; 1¾-1½"	10-12'; 1¾-2"	12-14'; 2-2½"			1.1.5.1	75'	Irregular head; Fine texture
QP	QUERCUS PALUSTRIS	PIN OAK		8-10'; 1¾-1½"	10-12'; 1¾-2"	12-14'; 2-2½"			1.1.5.1	75'	Pyramidal head; Drooping branches
QW	QUERCUS PHELLOS	WILLOW OAK		8-10'; 1¾-1½"	10-12'; 1¾-2"	12-14'; 2-2½"			1.1.5.1	50'	Conical to rounded head; Very fine texture
SB	SALIX 'BABYLONICA	BABYLON WEEPING WILLOW		8-10'; 1¾-1½"	10-12'; 1¾-2"	12-14'; 2-2½"			1.1.5.1	30'	Pendulous branches; Wet areas
TA	TILIA AMERICANA	AMERICAN LINDEN		8-10'; 1¾-1½"	10-12'; 1¾-2"	12-14'; 2-2½"			1.1.5.1	90'	Rounded head; Coarse texture
TD	TAXODIUM DISTICHUM	COMMON BALDCYPRESS		4-5'	5-6'	6-8'			1.1.5.2	150'	Feathery foliage; Russet fall color
ZS	ZELKOVA SERRATA	JAPANESE ZELKOVA		8-10'; 1¾-1½"	10-12'; 1¾-2"	12-14'; 2-2½"			1.1.5.2	90'	Good substitute for Elm; Yellow-russet color

* SECONDARY PLANT
+ A.S.N.S. - AMERICAN STANDARD FOR NURSERY STOCK

LARGE DECIDUOUS TREES

EVERGREEN TREES

			a	b	c	x	A.S.N.S. +	HEIGHT	REMARKS
AF	ABIES FRASERI	FRASER BALSAM FIR	3-4'	4-5'	5-6'		3.1.2.4	35'	Moist, cool slopes above 4000'
CD	CEDRUS DEODARA	DEODAR CEDAR	3-4'	4-5'	5-6'		3.1.2.4	150'	Gray-green pendulous branches
IO	ILEX OPACA	AMERICAN HOLLY	3-4'	4-5'	5-6'		4.1.3.5	45'	Pyramidal; Red berries
JV	JUNIPERUS VIRGINIANA	EASTERN REDCEDAR	3-4'	4-5'	5-6'		3.1.2.4	90'	Dense, pyramidal; Shredding bark
MG	MAGNOLIA GRANDIFLORA	SOUTHERN MAGNOLIA	3-4'	5-6'	8-10'		4.1.3.5	90'	Dense, pyramidal; Large leaves & flowers
PB	PINUS THUNBERGIANA	JAPANESE BLACK PINE	2-3'	3-4'	4-5'		3.1.2.4	90'	Dark-green foliage; Coastal areas
PE	PINUS ECHINATA	SHORTLEAF PINE	3-4'	4-5'	5-6'		3.1.2.4	100'	Dark blue-green foliage; Broad oval head
PT	PICEA PUNGENS	COLORADO SPRUCE	3-4'	4-5'	5-6'		3.1.2.4	100'	Blue-green foliage; Stiff needles
PT	PINUS TAEDA	LOBLOLLY PINE	3-4'	4-5'	5-6'		3.1.2.4	95'	Rounded head; Rapid grower; Sun to part shade
PV	PINUS SYLVESTRIS	SCOTCH PINE	3-4'	4-5'	5-6'		3.1.2.4	75'	Blue-green foliage
PW	PINUS STROBUS	WHITE PINE	3-4'	4-5'	5-6'		3.1.2.4	125'	Rounded or pyramidal habit; Soft-green
PZ	PINUS PALUSTRIS	LONGLEAF PINE	3-4'	4-5'	5-6'		3.1.2.4	90'	Course, rounded head
QV	QUERCUS VIRGINIANA	LIVE OAK	6-8'; 1¼-1"	8-10'; 1¼-1½"	10-12'; 1¾-2"		1.1.3.2	60'	Broad, rounded head; Fine texture
TC	TSUGA CAROLINIANA	CAROLINA HEMLOCK	3-4'	4-5'	5-6'		3.1.2.4	75'	Compact, pyramidal habit; Dk green
TN	TSUGA CANADENSIS	CANADA HEMLOCK	3-4'	4-5'	5-6'		3.1.2.4	90'	Slender, horizontal branching
PV	PINUS VIRGINIANA	VIRGINIA PINE	3-4'	4-5'	5-6'		3.1.2.4	45'	Open, stiff, sparse branching

+ A.A.N.A. - AMERICAN STANDARD FOR NURSERY STOCK

EVERGREEN TREES

EVERGREEN SHRUBS

				a	b	c	x		A.S.N.S.	HEIGHT	REMARKS
AD	AUCUBA JAPONICA 'MACULATA'	GOLDDUST AUCUBA	*		2½-3'	3-4'			4.1.3.4	15'	Requires shade; Variegated leaves
AG	ABELIA GRANDIFLORA	GLOSSY ABELIA			3-4'	4-5'			4.1.3.4	5'	Pink flower clusters; Dense; Hardy
BJ	BERBERIS JULIANAE	WINTERGREEN BARBERRY			3-4'	4-5'			4.1.3.4	6'	Yellow flower clusters; Very dense
CJ	CLEYERA JAPONICA	CLEYERA			2½-3'	3-4'			4.1.3.4	9'	Red-bronze to green; White flowers
CS	CAMELLIA SASANQUA var.	SASANQUA CAMELLIA		2½-3'	3-4'	4-5'			4.1.3.5	20'	White to pink flowers; Fall blooms
EK	EUONYMUS KIAUTSCHOVICUS	SPREADING EUONYMUS		2½-3'	3-4'	4-5'			4.1.3.4	9'	Hardy; Pink-red capsules
EP	ELAEAGNUS PUNGENS 'FRUITLANDI'	FRUITLAND ELAEAGNUS			3-4'	4-5'			4.1.3.4	12'	Thornless; Good for rural & urban
EY	EUONYMUS FORTUNEI	WINTERCREEPER EUONYMUS			2½" pot				6.6	4'	Dark green w/white veins; Semi-shrub
IB	ILEX CORNUTA 'BURFORDII'	BURFORD HOLLY		3-4'	4-5'	5-6'			4.1.3.4	15'	Dark green foliage; Globose
IC	ILEX CORNUTA ROTUNDA'	DWARF CHINESE HOLLY	*	12-15"	15-18"	18-24"			4.1.3.3	3'	Rounded, compact growth
IG	ILEX GLABRA	INKBERRY	*	3-4'	4-5'	5-6'			4.1.3.4	9'	Myrtle-like foliage; Wet areas
IH	ILEX CRENATA 'HELLERI'	HELLER'S JAPANESE HOLLY	*	12-15"	15-18"	18-24"			4.1.3.1	3'	Globose & compact; Dark green
IN	ILEX VOMITORIA 'NANA'	DWARF YAUPON	*	12-15"	15-18"	18-24"			4.1.3.4	3'	Globose & compact; Grey stems
IV	ILEX VOMITORIA	YAUPON HOLLY		3-4'	4-5'	5-6'			4.1.3.3	24'	Red berries; Good for dry areas
JD	JUNIPERUS CHINENSIS PFITZ. 'COMPACTA'	COMPACT PFITZER JUNIPER		12-15"	15-18"	18-24"			3.1.2.2	3'	Dense & compact; Grey-green foliage
JP	JUNIPERIS CHINENSIS PFITZERIANA	PFITZER JUNIPER		18-24"	24-30"	3-4'			3.1.2.2	10'	Broad & flat-topped; Good for urban areas
KL	KALMIA LATIFOLIA	MOUNTAINLAUREL		3-4'	4-5'	5-6'			4.1.3.4	30'	Pink to white flower clusters; Acid soil
LJ	LIGUSTRUM JAPONICUM	JAPANESE PRIVET		24-30"	3-4'	4-5'			4.1.3.4	12'	Glossy foliage; Black berries
LL	LIGUSTRUM LUCIDUM	GLOSSY PRIVET		3-4'	4-5'	5-6'			4.1.3.4	30'	Tree-type habit; Dark green waxy foliage
MC	MYRICA CERIFERA	SOUTHERN WAXMYRTLE		3-4'	4-5'	5-6'			4.1.3.4	36'	Shrub or tree; Willowy foliage
ML	MAHONIA BEALEI	LEATHERLEAF MAHONIA		24-30"	2½-3'	3-3½'			4.1.3.4	12'	Dark blue-green foliage; Partial shade
MM	MAHONIA AQUIFOLIUM	HOLLY MAHONIA		24-30"	2½-3'	3-3½'			4.1.3.4	4'	Dk green; Grape-like berries; Bronze-red color
ND	NANDINA DOMESTICA	NANDINA	*		2½-3'	3-3½'			4.1.3.4	8'	White flower clusters; Red berries; Scarlet color
O	OSMANTHUS HETEROPHYLLUS	HOLLY OSMANTHUS		2½-3'	3-3½'	3½-4'			4.1.3.4	18'	Dk green holly-like foliage; Sun or part shade
PC	PRUNUS CAROLINIANA	CAROLINA LAURELCHERRY		3-4'	5-6'	6-8'			4.1.3.5	25'	Dense habit w/glossy foliage; Shrub or tree
PG	PHOTINIA GLABRA	JAPANESE PHOTINIA		3-4'	4-5'	5-6'			4.1.3.4	8'	Glossy foliage; Young foliage is red
PR	PHOTINIA SERRULATA	CHINESE PHOTINIA		3-4'	4-5'	5-6'			4.1.3.4	36'	Young foliage is red; Well-drained areas
RC	RHODODENDRON CAROLINIANUM	CAROLINA RHODODENDRON		2½-3'	3-4'	4-5'			4.1.3.4	6'	White to rose flowers; Compact & rounded habit
RI	RHODODENDRON INDICUM	INDICA AZALEA	*	18-24"	2½-3'	3-4'			4.1.3.4	6'	Red to scarlet flowers; Hardy
RO	RHODODENDRON OBTUSUM JAP.	KURUME AZALEA	*	12-15"	15-18"	18-24"			4.1.3.2	3'	White, red, pink & salmon flowers; Red color
RR	RHODODENDRON HYBRIDA	HYBRID RHODODENDRON		18-24"	2½-3'	3-4'			4.1.3.4	5'	Dk green foliage; Red to white flowers; Slow
RW	RHODODENDRON CATAWBIENSE	CATAWBA RHODODENDRON	*	18-24"	2½-3'	3-4'			4.1.3.4	6'	Spreading habit; Profuse purple-white blooms
VR	VIBURNUM RHYTIDOPHYLLUM	LEATHERLEAF VIBURNUM	*	24-30"	2½-3'	3-3½'			4.1.3.4	9'	Easily 'wind-burned'; Red or black berries

* SECONDARY LIST
+ A.S.N.S. - AMERICAN STANDARD FOR NURSERY STOCK

EVERGREEN SHRUBS

SMALL or FLOWERING TREES

				a	b	c	x		A.S.N.S. +	HEIGHT	REMARKS
AA	ACER PALMATUM	JAPANESE MAPLE	*	3-4'	4-5'	5-6'			1.1.3.4	20'	Green to red color; Moundlike habit
AB	ACER PALMATUM 'ATROPURPUREUM'	BLOODLEAF JAPANESE MAPLE	*	3-4'	4-5'	5-6'			1.1.3.4	20'	Very hardy; Dark red leaves in season
AC	AMELANCHIER CANADENSIS	SHADBLOW SERVICEBERRY		4-5'	5-6'	6-8'			2.1.5.4	60'	Upright habit; Yellow to red fall color
CA	CARPINUS CAROLINIANA	AMERICAN HORNBEAM		6-8'; ⅞"	8-10'; 1"	10-12'; 1¼"			1.1.3.3	36'	Multi-stemmed; Gray bark; Yellow to red
CC	CERCIS CANADENSIS	EASTERN REDBUD		4-5'	5-6'	6-8'			1.1.3.3	36'	Flat-top irreg growth; Pink flowers
CF	CORNUS FLORIDA	FLOWERING DOGWOOD		4-5'	5-6'	6-8'			1.1.3.4	40'	White flowers; Scarlet fall color
CP	CRATAEGUS PHAENOPYRUM	WASHINGTON HAWTHORNE		4-5'	5-6'	6-8'			1.1.3.5	30'	Columnar, dense branching; Red berries
CW	CHIONANTHUS VIRGINICUS	WHITE FRINGETREE	*	4-5'	5-6'	6-8'			2.1.3.5	30'	White feathery flowers; Yellow fall color
KP	KOELREUTERIA PANICULATA	PANICLED GOLDENRAIN TREE	*	4-5'	5-6'	6-8'			1.1.3.1	30'	Yellow panicled flowers; Flat-topped head
LI	LAGERSTROEMIA INDICA	COMMON CRAPEMYRTLE		4-5'	5-6	6-8'			1.1.3.4	21'	White, red, or lavender flowers; Flaky bark
MB	MALUS BACCATA	SIBERIAN CRABAPPLE		4-5'	5-6'	6-8'			1.1.3.3	50'	White flowers; Upright, narrow head; Hardiest
ME	MALUS 'KATHERINE'	KATHERINE CRABAPPLE		4-5'	5-6'	6-8'			1.1.3.3	30'	Double white flowers; Red fruit
MF	MALUS FLORIBUNDA	JAPANESE FLOWERING CRABAPPLE		4-5'	5-6'	6-8'			1.1.3.3	30'	Deep pink to red flowers; Rounded head
MH	MALUS 'HOPA'	HOPA CRABAPPLE		4-5'	5-6'	6-8'			1.1.3.3	30'	Rose flowers; New foliage is maroon
MO	MAGNOLIA SOULANGEANA	SAUCER MAGNOLIA		3-4'	4-5'	5-6'			1.1.3.4	25'	White to purple flowers; Shrublike stems
MV	MAGNOLIA VIRGINIANA	SWEETBAY MAGNOLIA		2-3'	3-4'	4-5'			1.1.3.4	60'	White fragrant flowers; Semi-evergreen
PP	PRUNUS CERASIFERA 'ATROPURPUREA'	PURPLELEAF PLUM		4-5'	5-6'	6-8'			1.1.3.3	24'	Reddish-purple foliage; Pink flowers
PU	PRUNUS SERRULATA 'KWANZAN'	KWANZAN CHERRY		4-5'	5-6'	6-8'			1.1.3.3	20'	Upright, low-branched; Deep pink flowers
PY	PRUNUS YEDOENSIS	YOSHINO CHERRY		4-5'	5-6'	6-8'			1.1.3.3	48'	White to pink flowers; Flat-topped, bushlike
SU	SORBUS AUCUPARIA	EUROPEAN MOUNTAINASH	*	4-5'	5-6'	6-8'			1.1.3.4	45'	White flowers; Red berries; Red fall color
PD	PYRUS CALLERYANA 'BRADFORD'	BRADFORD PEAR		4-5	5-6'	6-8'			1.1.3.3	30'	White flowers; Pyramidal habit; Red fall color

* SECONDARY PLANT
+ A.S.N.S. - AMERICAN STANDARD FOR NURSERY STOCK

SMALL or FLOWERING TREES

DECIDUOUS SHRUBS

				a	b	c	x	SOURCE	A.S.N.S. +	HEIGHT	REMARKS
CL	CHAENOMELES SPECIOSA	FLOWERING QUINCE		18-24"	24-30"	2½-3'			2.1.5.4	6'	Apple-like fruit; Red, white, orange & salmon blooms
CN	CORNUS SERICEA	REDOSIER DOGWOOD			4-5'	5-6'			2.1.3.3	7'	Red twigs in winter; Good for moist areas
EA	EUONYMUS ALATA	WINGED EUONYMUS		18-24"	24-30"	2½-3'			2.1.5.5	9'	Horizontal branches; Scarlet fall color
FI	FORSYTHIA INTERMEDIA	BORDER FORSYTHIA			2½-3'	3-4'			2.1.5.4	9'	Yellow flowers; Upright & arching habit
HY	HYPERICUM PATULUM 'HIDCOTE'	HENRY ST. JOHNSWORT		15-18"	18-24"	24-30"			6.1	3'	Yellow flowers, June-Oct.; Semi-evergreen
LF	LONICERA FRAGRANTISSIMA	WINTER HONEYSUCKLE			2½-3'	3-4'			2.1.5.4	6'	White flowers; Red berries; Semi-evergreen
MS	MAGNOLIA STELLATA	STAR MAGNOLIA			4-5'	5-6'			1.1.5.4	20'	White to red flowers; Bronze-yellow color
RG	RHUS GLABRA	SMOOTH SUMAC		18-24"	24-30"	3-4'		COLLECTED	2.1.5.6	12'	Green flower spikes to red in fall; Scarlet
RH	ROSA HYBRIDA	CLIMBING ROSE	*	No 3	No 2	No 1			5.5	40' (To Trained)	Variable flower colors; Sun or part shade
SA	SASSAFRAS ALBIDUM	COMMON SASSAFRAS		18-24"	24-30"	3-4'		COLLECTED	1.1.3.5	60'	Grows in poor soil; Orange-scarlet color
ST	SPIRAEA THUNBERGI	THUNBERG SPIREA			2½-3'	3-4'			2.1.3.4	5'	Feathery foliage; Tiny white flower clusters
SV	SPIRAEA VANHOUTTEI	VANHOUTTE SPIREA			2½-3'	3-4'			2.1.3.4	6'	White flower clusters; Best of species
CS	CYTISUS SCOPARIUS	SCOTCH BROOM		2-2½'	2½-3'	3-4'			2.1.5.4	6'	Yellow pea-like flowers, green winter twigs
RJ	RHUS COPALLINA	FLAMELEAF SUMAC		18"-24"	2-3'	3-4'			2.1.5.6	30'	Green flower spikes, crimson fruit, scarlet
RR	ROSA RUGOSA	RUGOSA ROSE		No 2	No 1½	No 1				6'	pink & white, single flowers; orange in autumn

* SECONDARY PLANT
+ A.S.N.S. - AMERICAN STANDARD FOR NURSERY STOCK

DECIDUOUS SHRUBS

GROUNDCOVERS & VINES

				a	b	c	x		A.S.N.S. +	HEIGHT	REMARKS
AJ	AJUGA REPTANS	CARPET BUGLE	*			2½" pot			6.6	4"	Dk green foliage; Blue flowers; Part shade & high moisture
CH	COTONEASTER HORIZONTALIS	ROCK COTONEASTER	*			3" pot			4.1.3.1	2½'	Flat growth; Red berries; Red fall color
CV	CORONILLA VARIA	CROWNVETCH		SEED	CROWN	2½" pot			6.5	18"	Full sun or part shade; Pastel blooms; Deciduous
EF	EUONYMUS FORT. VEG. COLORATA	PURPLELEAF WINTERCREEPER				2½" pot			6.6	3'	Purple-red foliage during fall & winter
GS	GELSEMIUM SEMPERVIRENS	CAROLINA JESSAMINE				2yr. No. 1			6.1	20' (IF TRAINED)	Dk green to wine; Yellow flowers; Sun or shade
HH	HEDERA HELIX	ENGLISH IVY	*			2½" pot			6.6	90' (IF TRAINED)	Evergreen; Black berries
JA	JUNIPERUS HORIZ. PLUMOSA	ANDORRA CREEPING JUNIPER		12-15"	15-18"	18-24"			3.1.2.1	1½'	Feathery foliage; Purple fall color
JC	JUNIPERUS CONFERTA	SHORE JUNIPER		12-15"	15-18"	18-24"			3.1.2.1	12"	Needle-like foliage; Good for sand
JW	JUNIPERUS HORIZ. WILTONII	BLUE RUG JUNIPER		12-15"	15-18"	18-24"			3.1.2.1	6"	Blue color during winter; Prostrate habit
LH	LONICERA JAPONICA 'HALLIANA'	HALL'S JAPANESE HONEYSUCKLE				4" pot			6.6	15' (IF TRAINED)	White to yellow flowers; Semi-evergreen
LM	LIRIOPE MUSCARI	BIGBLUE LIRIOPE				4" pot			6.4	8"	Dk green; Lavender blooms; Black berries; Shade
WS	WISTERIA SINENSIS	CHINESE WISTERIA	*			2yr. No. 1			6.1	25' (IF TRAINED)	Blue-violet flower clusters; Deciduous
CA	CLEMATIS PANICULATA	SWEET AUTUMN CLEMATIS				2 yr. heavy			6.3	30'	White, fragrant, profuse flowers
HF	HEMEROCALLIS FULVA	TAWNY DAYLILY			1 FAN	3 FAN				6'	Large, orange flowers.
HL	HEMEROCALLIS LILIOASPHODELUS	YELLOW DAYLILY			1 FAN	3 FAN				3'	Large, lemon-yellow flowers
RS	ROSA WICHURAIANA	WICHURA ROSE				2yr. No. 1			6.1	8'	Semi-evergreen trailing, white flowers.

* SECONDARY PLANT
+ A.S.N.S. - AMERICAN STANDARD FOR NURSERY STOCK

GROUNDCOVERS & VINES